REMARKS

Reconsideration and allowance in view of the following remarks is requested. No amendments have been made to the claims. Thus, claims 1, 3-5, 7, 9-13 and 15-31 are pending in the application. Applicants respectfully request reconsideration of the claims.

Examiner Interview

Applicant, Dr. Christiane Ripp, and Applicants' representative, Ryan Wallace, wish to thank Examiner Crepeau for extending the courtesy of the office interview held on September 29, 2009, and for the helpful and courteous discussions. Applicants' representative believes that prosecution of the present application was materially advanced based on the discussion of the pending claims, the Examiner's rejections set forth in the Office Action mailed May 15, 2009, and the prior art, as summarized in the September 29, 2009 Examiner Interview Summary.

Declaration Under 37 C.F.R. § 1.132

What a prior art reference teaches one of ordinary skill in the art is a question of fact. *In Re John R. Beatie*, 974 F.2d 1309, 1313 (Fed. Cir. 1992). Applicants submit herewith the Second Declaration of Christiane Ripp (the "Second Ripp Decl.") providing information regarding the prior art cited in the most recent Office Action.

Rejections Under 35 U.S.C. § 103(a)

Claims 1, 3-5, 7, 9, 10, 13 and 15-31 were rejected under 35 U.S.C. § 103(a) as obvious over WO 00/44061. The Examiner asserts that U.S. Patent 6,709,789 to Hambitzer et al. ("the '789 patent") is an English equivalent of WO 00/44061. Applicants respectfully traverse each of the rejections and submit that the '789 patent, taken alone or in combination with other art or the knowledge of one having ordinary skill in art, does not disclose or suggest each and every feature of any of claims 1, 3-5, 7, 9, 10, 13 and 15-31.

As has been described in prior responses, the '789 patent teaches an electrochemical cell

in which safety is increased by providing a salt in solid state in a porous structure in the range of at least one of the electrodes. The safety features which result from the invention embodied by the '789 patent are primarily achieved through chemical reactions with the salt, and not the physical nature of the microporous structure as in the present claims. (Col. 7, lines 16-35 of the '789 patent). Two embodiments are described by the '789 patent for incorporating salt into the cell:

1) A particulate structure consisting of salt particles which may be a loose filling of salt grains or may be a solid body formed by binding of salt particles or by sintering of salt grains (as shown in Fig. 2 and col. 4, lines 13-32 of the '789 patent);

2) Coating of the salt onto a porous carrier material, which can either be rigid (e.g., made from glass or oxide ceramics) or a flexible fiber compound structure (e.g., in the form of felt fleece or fabric)(as shown in Fig. 3 and col. 4, lines 33 to 60 of the '789 patent).

In either embodiment, in order to achieve the safety benefits of the '789 patent, the pores have to be of sufficient size so that a discharge of active mass, which grows at the electrode during charge or discharge of the cell, comes into contact with a sufficient surface area of salt particles when penetrating into the porous structure. (Col. 3, lines 15-30 of the '789 patent). This large surface area contact is a requirement of a sufficient chemical (or physical-chemical) effect of the salt.

The second embodiment, which discloses an inert carrier body coated with salt and upon which the Examiner bases the obviousness rejection, fails to disclose structure forming, non-ionically dissociating solid particles or a volume proportion of at least 40%. In order to arrive at

the invention of the present claims, the Examiner alleges these two important features would have been obvious to one of ordinary skill in the art stating that "the artisan would have been motivated to use spherical "particles" rather than fibers, as the carrier material, absent a new or unexpected result." (May 15, 2009 Office Action at p. 3). There are several reasons why one of skill in the art would not have been motivated to use the carrier material of this embodiment of the '789 patent in particulate form.

As described above and in prior responses, the safety features of the '789 patent result from the chemically reactive nature of the salt. In order to maximize this effect, the salt must be arranged so as to provide space for the active mass to grow and still contact as much surface area of the salt as possible. The '789 patent describes that in the embodiment using loosely packed, solid salt particles, there is a possibility that the growth of the active mass would displace the salt from the electrode surface thus diminishing the safety effect. (Col. 4, line 61-67; Col. 5, lines 1-6 of the '789 patent). The embodiment in which the salt is coated on the inert carrier material addresses this potential issue of displacing the salt by providing increased mechanical stability and allowing for the porous structure to be fixed to the surface of the electrode such that an active mass generated at the electrode surface penetrates into the pores and contacts the salt, without displacing the salt. (Col. 4, lines 33-48; Col. 5, lines 6-14). The only reason for adding the additional weight and manufacturing costs of the salt coated inert carrier material is to avoid the issue of the displacement of the loose particles by increasing mechanical stability. Therefore, there would simply be no motivation for one of skill in the art to use loose, spherical particles as a carrier material as suggested in the Office Action. Using spherical carrier particles coated with salt would increase the weight of the cell and reduce the amount of surface area for active mass to contact the salt while adding no additional mechanical stability nor allowing the porous

structure to be fixed to the electrode. Spherical carrier particles coated with a salt could be dislodged from the electrode surface in the same manner as salt particles meaning that using spherical carrier particles coated with salt would increase the weight and manufacturing expensive of the cell without achieving the benefits provided by the fibrous carrier material. Therefore, using spherical carrier particles would not have been suggested by the teachings of the '789 patent. In fact, one of ordinary skill in the art would have expected such a configuration to cause deleterious results. Therefore, it clearly would have been against the rationale of the '789 patent and not obvious to one having skill in the art to use ceramic in a particulate form as the carrier of the salt particles.

Furthermore, the inert fibrous material of the '789 patent is described as a carrier for salt. There is no embodiment disclosed in which the inert material is configured such that an uncoated, inert surface is in direct contact with the substrate of the negative electrode as required by the present claims. There is no suggestion in the '789 patent that the safety improvements could be achieved through the use of the inert carrier material which was not coated with salt. Therefore, there would have been no reason for one having skill in the art to use the carrier material that was not coated with salt, much less in a particulate form.

Additionally, the Office Action states that "the skilled artisan would be motivated to compact, densify, or interconnect the powder so as to make it an integrated layer" which would provide motivation to pursue a solid volume percentage of at least 40% by volume. The '789 patent clearly teaches away from such a high solid volume proportion. Specifically, the '789 patent teaches that a large surface contact should be provided between the salt and the substances which are formed at the electrode. (Col. 3, lines 24-26 of the '789 patent). In the case of the salt being contained in a porous solid matter layer, the'789 patent teaches away from a highly

compacted structure noting that "the structure in which the salt is contained should not have too small pores." (Col. 5, lines 5-6 of the '789 patent). Given that one of ordinary skill in the art would have understood that the increased safety resulting from the features of the'789 patent is better accomplished with larger pores, there clearly would have been no reason to adjust the volume proportion of solid particles to levels as high as those required by the current claims.

A second declaration from Dr. Christiane Ripp, who is an inventor of the present application and a consultant working for the assignee of the'789 patent and who has access and personal knowledge of both the experiments described in the Examples of the present application and the '789 patent, is submitted with this response. (*See* Second Ripp Decl. ¶¶ 1-3). Dr. Ripp describes the properties of a fibrous carrier material actually used in battery cells according to the invention of the '789 patent. (*See* Second Ripp Decl. ¶ 5). Dr. Ripp shows calculations for determining the solid volume proportion of this exemplary material. (*See* Second Ripp Decl. ¶¶ 6-8). The solid volume proportion of the exemplary fibrous carrier material was calculated by Dr. Ripp to be 3.6%. (*See* Second Ripp Decl. ¶ 8). The fact that the solid volume proportion of a fibrous carrier material actually used in a functioning embodiment of the '789 patent is so much lower than the 40% required by the present claims is further evidence that one of ordinary skill in the art would not have been motivated to use a volume percentage as high as 40% based on the teachings of the '789 patent.

Finally, in the Response to Arguments/Declarations, the Office Action cites to *KSR* as supporting the argument that one of ordinary skill in the art would have been motivated to the 40% volume by the teachings of the '789 patent. (May 15, 2009 Office Action at p. 7). The full citation from KSR states:

> When there is a design need or market pressure to solve a problem and there are a finite number of identified, predictable solutions, a person of ordinary skill in the

> art has good reason to pursue the known options within his or her technical grasp. If this leads to the anticipated success, it is likely the product not of innovation but of ordinary skill and common sense.

(*KSR v. Teleflex*, 127 S.Ct. 1727 (2007)). This holding from *KSR* is inapplicable in this case. While increasing the safety of batteries of this type may be a known problem to persons of skill in the art, there are not "a finite number of identified, predictable solutions." The use of the physical properties of tightly-packed, inert particles to improve the safety of battery cells as in the present claims is clearly not just a variation of the use of the chemically reactive nature of salt particles to improve the safety of battery cells as in the '789 patent. Any suggestion that the elements would have been obvious to try, particularly in light of the fact that the'789 patent teaches away from these missing elements, is clearly based on hindsight and knowledge of the present invention.

For all of the reasoned explained above, the invention of the present claims is not obvious over the teachings of the '789 patent and Applicants respectfully request withdrawal of all the pending rejections.

Claims 11 and 12 were rejected under 35 U.S.C. § 103(a) as obvious over WO 00/44061 (the '789 patent) in view of Aihara et al. (2002/0102456). As described above, the '789 patent fails to disclose or suggest several limitations required in claim 1, from which claims 11 and 12 depend. Applicants submit that claims 11 and 12 are allowable as depending from an allowable base claim and respectfully request withdrawal of all the rejections of claim 11 and 12.

Double Patenting

Claims 1, 3-5, 7, 9-13 and 15-31 were rejected on the ground of nonstatutory obviousness-type double patenting as being unpatentable over claims 1-15 of U.S. Patent No. 6,709,789. The claims of the '789 patent all require that the cell contain a salt which is provided

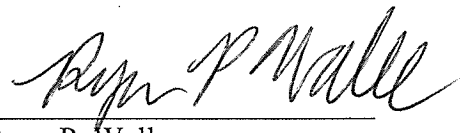
in such a manner that it is in contact with the active mass deposited at the electrode. In contrast, the present claims all require a porous structure made of a non-ionically dissociating material (i.e., not a salt) contacting the substrate of the negative electrode and positioned in such a manner that the active mass is deposited into the pores. As described above with respect to the obviousness rejections under 35 U.S.C. § 103(a), the '789 patent fails to suggest or disclose the use a porous structure comprised of inert, non-ionically dissociating particles with a volume proportion of at least 40% in contact with the substrate of the negative electrode as required by the present claims. Accordingly, Applicants respectfully request withdrawal of the nonstatutory obviousness-type double patenting rejection of claims 1, 3-5, 7, 9-13 and 15-31.

Conclusion

In view of the foregoing remarks and the declaratory evidence submitted herewith, which should be given substantial weight, Applicants submit that the rejection of each of claims 1, 3-5, 7, 9-13 and 15-31 is improper because the cited prior art fails to disclose or suggest each and every element of the claims. Reconsideration and allowance are requested. If the Examiner believes, for any reason, that personal communication will expedite prosecution of this application, the Examiner is invited to telephone the undersigned at the number provided.

In the event that this paper is not timely filed, the Applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account No. 02-2135.

Respectfully submitted,

By: 

Ryan P. Wallace
Registration No. 60,212
Attorneys for Applicants
ROTHWELL, FIGG, ERNST & MANBECK
1425 K. Street, Suite 800
Washington, D.C. 20005
Telephone: (202) 783-6040